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Mathematician and Artist within

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Original Tessellation Painting by Mariela Robledo (below)



Mathematician and Artist within

Many people categorize themselves as either being good at mathematics or being a great artist. It seems to be a pattern among the masses, to be artistic or be logical, but there are also the select few that are talented in both. There is no better way to explain the influence that art and mathematics have amongst each other than with G.H. Hardy's words: "A mathematician, like a painter or poet, is a maker of patterns" [4]. M.C. Escher is a great example of how artistic talent and mathematical concepts combined can create the most stunning works of art. His collections of tessellation paintings are the artistic proof of how mathematics is everywhere, even in art.

The word tessellations is derived from the Latin word 'tessera', which are small stone cubes used to make mosaic pictures decorating floors and tiles in Roman buildings [1]. Its artistic meaning in modern times now refers to tessellations as repeating pictures of animal, human, and objects throughout a surface which are constructed using symmetrical and asymmetrical shapes without overlapping one another. Some of the most commonly seen shapes are isosceles triangles, rectangles, and squares, although birds, fish, and frogs seem to be preferred by Escher.

Maurits Cornelis Escher, more commonly known as M.C. Escher, defined tessellations as "the regular division of a plane" [1]. Although many artists embraced tessellations, M.C. Escher is dubbed the father of modern tessellations. His first

known tessellation is *Lions* (next figure), which he completed in 1925.



M.C. Escher was fascinated by what he called metamorphoses, where he would set free his tessellations by having the forms come out of the pattern, and move about the painting itself. In an essay he wrote about tessellations after he was inspired by the patterns in Spain's Alhambra, Escher says:

"In mathematical quarters, the regular division of the plane has been considered theoretically ... Does this mean that it is an exclusively mathematical question? In my opinion, it does not. [Mathematicians] have opened the gate leading to an extensive domain, but they have not entered this domain themselves. By their very nature they are more interested in the way in which the gate is opened than in the garden lying behind it." [2]

Escher saw that what many mathematicians deemed logically impossible, he could make happen artistically. The visualization of mathematics made it all possible. Escher comments on how mathematicians should realize that although math is the basis of everything, there is also a lot of art in mathematics. These artistic concepts would aid in the process of mathematical innovation. Interestingly enough, many of Escher's best works were inspired by intellectual conversations with his mathematician colleagues [3]. He was able to create illogical, impossible forms in his artwork using math.

Mathematics is the foundation of our surroundings. Clouds, flowers, and even vases have formulas; it is in physics, chemistry, economics, and even art. Although many people would disagree with the latter, mathematics is a necessary complement to art, M.C. Escher's tessellation paintings prove this. In his paintings, the importance of math is priceless, for without the necessary angles and carefully chosen forms, his works of art would not be as prominent as they have been to both artists and mathematicians alike. Therefore, it is acceptable to claim that behind a great artist, there is a great mathematician.

Works cited

1. <http://www.tessellations.org/tess-escher1.htm>
2. <http://www.mathacademy.com/pr/minitext/escher/>
3. http://en.wikipedia.org/wiki/Mathematics_and_art
4. <http://www.ams.org/mathimagery>

